

UTILITY APPLICATION  
FOR  
UNITED STATES LETTER PATENT

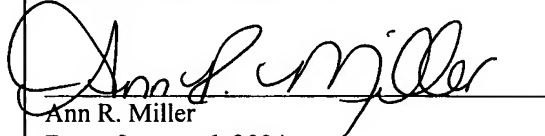
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Title: **Apparatus and Method of Assembly of Fixed  
Blade Knife**

Docket No. **127P052**

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Ann R. Miller

Date: January 6, 2004

Application Of: Philip Gibbs

For: Apparatus and Method of Assembly of Fixed Blade Knife

### BACKGROUND OF THE INVENTION

**[0001]** The present invention relates to knives and bayonets having integral blade and tang portions with a handle portion covering the tang and secured by a screw and nut. More particularly, the invention relates to improved means for incorporating a threaded fastener into a knife or bayonet to releasably secure an integral blade and tang in assembled relation with a handle.

**[0002]** U.S. Patent No. discloses a fixed blade knife wherein the head of a machine screw is placed in a slot formed in one end of a tang with a blade extending integrally from the opposite end. The threaded portion of the screw extends through a narrower portion of the slot. A stamping or pressing operation flattens the head of the screw to substantially the same thickness as the tang, an operation which, in effect, makes the screw physically integral with the tang. Although this arrangement represented an improvement in manufacturing technique over previous methods of securing an integral blade and tang to a handle piece, it has been found that under conditions of severe use, where high loads are placed on the blade and transmitted to the tang, the screw is subject to cracking or breaking. Because the screw head is essentially integral with the tang, a defective screw cannot be replaced, thus rendering the entire knife, with the possible exception of the handle piece, useless.

**[0003]** It is a principal object of the present invention to provide means for and methods of releasably retaining an integral knife blade and tang in assembled relation with a handle piece of a fixed blade knife or bayonet.

[0004] Another object is to provide a knife having a slotted tang extending from a blade wherein a two-piece threaded fastener is engaged with the tang and a handle in a manner which facilitates field repair in the event of failure of the fastener.

[0005] A further object is to provide a novel and improved fixed blade knife, which may be fitted for use as a bayonet, having a blade with integral tang and a handle piece which are releasably held in assembled relation by a two-piece threaded fastener, and methods of fabricating and assembling such knives, wherein damaged portions of the fastener may be easily replaced in the original blade-tang and handle piece.

[0006] Additional objects will in part be obvious and in part appear hereinafter.

#### SUMMARY OF THE INVENTION

[0007] In accordance with the foregoing objects, the invention contemplates a fixed blade knife comprising two parts, namely, an integral blade and tang., contiguous along a linear axis, formed from a single piece of stainless steel or other suitable metal, and a handle, preferably molded from a suitable plastic. The tang has a constant length, width and thickness, adjoining the blade at a stepped shoulder providing an abutment surface for the handle in the assembled relation of the two parts. At the end opposite its integral connection to the blade, termed the terminal end, a slot is cut into the tang, extending into the terminal end, symmetrical to the longitudinal axis of the tang. The slot includes a first portion, having a first width and extending into the terminal end for a first distance, and a second portion, extending having a second width, greater than the first width, from the first portion for a second distance.

[0008] The blade/tang and handle pieces are placed in assembled relation by passing the tang into a through opening in the handle, and are releasably retained in this

relation by a two-piece threaded fastener, i. e., a machine screw and a nut. The nut has an outer surface which is cylindrical with opposite sides flattened to lie in planes spaced by a distance equal to or slightly less than the second width of the slot in the tang, permitting the nut to be laterally inserted into the second portion of the slot. The screw which mates with the threaded, through opening in the nut has a threaded portion of first diameter, equal to or slightly less than the first width of the slot, and a head of second diameter, larger than the first diameter. The handle piece has a through, longitudinal opening extending from a proximal to a distal end. The cross-sectional shape of the opening at the distal end is circular with rectangular portions on opposite sides (this shape being termed for convenience a "keyhole" shape) and extends in this shape for a distance at least equal to the length of the tang. The keyhole shaped opening is adjoined by a first, cylindrical opening having a diameter equal to or slightly less than the first diameter and a length less than the length of the threaded portion of the screw. The first cylindrical opening is adjoined by a second, cylindrical opening having a diameter equal to or slightly less than the second diameter, thus being of a size to contain the screw head.

**[0009]** In assembly, the nut is placed in the second portion of the tang slot with the threaded opening in the nut substantially aligned with the longitudinal axis of the slot; the flat sides of the nut will be closely retained between opposing sides of the slot. The terminal end of the tang is then inserted into the distal end of the opening in the handle piece, where the rounded sides of the nut and marginal portions along each side of the tang will be closely surrounded by the keyhole shaped opening. The tang is advanced until the distal end of the handle piece contacts the stepped shoulder where the blade and tang are integrally joined, with the entire tang being positioned within the handle piece.

The threaded end of the screw is then advanced through the cylindrical openings in the proximal end of the handle and threaded into the nut. A screwdriver or other suitable tool is used to tighten the screw, thereby retaining the blade/tang and handle pieces in assembled relation. If either or both parts of the threaded fastener become damaged or broken, the screw is removed, the blade/tang and handle disassembled, and the damaged portion(s) discarded and replaced, followed by assembling the pieces again as described above.

[0010] The foregoing and other features of structure and steps of fabrication and assembly of the invention will be more readily understood and fully appreciated from the following detailed disclosure, taken in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Figure 1 is a side elevational view of the knife with all parts in assembled relation;

[0012] Figure 1A is an end elevational view of one of the elements of Figure 1;

[0013] Figure 2 is the same view as Figure 1 with the handle piece in vertical section;

[0014] Figure 3 is an exploded perspective view of the knife; and

[0015] Figure 4 is an elevational view in cross section on the line 4-4 of Figure 2.

#### DETAILED DESCRIPTION

[0016] Although the implement of the invention is shown and described as a fixed blade knife it will be readily understood that, by providing conventional attachment means, the implement may be mounted upon a rifle or similar weapon and utilized in the manner of a bayonet. The illustrated version of the knife, denoted generally by reference

numeral 10, comprises an integral blade 12 and tang 14 piece and handle piece 16, and a two-piece threaded fastener, illustrated in the form of nut 18, having threaded, through bore 19, and machine screw 20. Blade 12, having pointed, distal end 22 and cutting edge 24, is formed integrally with tang 14 from a single piece of suitable metal alloy. Stepped shoulders 26 are formed at the junction of blade 12 and tang 14. Both blade 12 and handle 16 may take any form suitable to the intended use of the knife and are substantially aligned along a mutual, longitudinal axis in the assembled relation of the pieces.

[0017] A slot is formed in tang 14, extending into terminal end 28 for a first distance D1 having a width W1, and for a second distance D2, greater than D1, having a width W2, greater than W1. Nut 18 has a cylindrical outer surface having a diameter d1 with opposite sides 30, 30' flattened to lie in parallel planes spaced by distance d2, equal to or slightly less than width W2 of the tang slot. Screw 20 has a threaded portion 32 for engagement with the threaded bore 19 of nut 18, as well as head portion 34.. As seen in Figure 3, opening 36 extends into the distal end of handle piece 16 and has a cylindrical central portion of diameter d1, or slightly greater, and rectangular portions having a width equal to or slightly greater than thickness T of tang 14 on opposite sides of the cylindrical portion, such shape being termed for convenience "keyhole" shaped. Opening 36 extends with the keyhole shaped cross section from the distal end of handle piece 16 to an inner end 38 near the proximal end of handle piece 16 where it merges with cylindrical opening 40, having diameter equal to or slightly greater than the diameter of threaded portion 32 of screw 30. Cylindrical opening 40 merges with cylindrical opening 42 which extends

to the proximal end of handle piece 16 and has a diameter at least large enough to accommodate head 34.

**[0018]** The parts are assembled, as indicated in Figure 1, by moving nut 18 laterally into the portion of the tang slot of width W2, i.e., a dimension equal to or slightly greater than the distance between planar sides 30, 30' of the nut. Terminal end 28, with nut 18, is inserted into keyhole shaped opening 36 and advanced until shoulders 26 contact the distal end of handle piece 16, which may be substantially when terminal end 28 of tang 14 contacts the inner end of opening 36, i.e., tang 14 has a length substantially equal to or slightly less than the axial length of the keyhole cross section opening in handle piece 16. Threaded portion 32 of screw 20 is then inserted through openings 42 and 40 to threadedly engage nut 18. Upon tightening of screw 20, using a screwdriver or other appropriate tool, the blade/tang piece 12/14 is securely assembled with handle piece 16. Should screw 20, and/or nut 18, become damaged or broken, the parts may be disassembled and a new screw and/or nut used in reassembling the knife.